

## G. SCIENCE APPLICATIONS

<p><b>Content Standard:</b> Students in Wisconsin will demonstrate an understanding of the relationship between science and technology and the ways in which that relationship influences human activities.</p> <p><b>Rationale:</b> Science and technology compliment each other. Science helps drive technology and technology provides science with tools for investigation, inquiry, and analysis. Together, science and technology applications provide solutions to human problems, needs, and aspirations. Students should understand that advances in science and technology affect the earth's systems.</p>			
<b>Performance Standards: By the end of grade four students will:</b>	<b>Sample Alternate Performance Indicators: (1-3 per standard)</b>	<b>Sample Performance Activities/Tasks: (1-2 per indicator)</b>	<b>Sources of Data</b>
G.4.1. Identify the technology used by someone employed in a job or position in Wisconsin and explain how the technology helps[2]	1. Identify technology use in Wisconsin[1] 2. Identify the technology used by someone employed in Wisconsin[1] 3. Explain how technology helps in jobs[2]	1.a. Match examples of technology to job(1) 2.a. Shadow a person in their job and determine technology used(1) 3.a. Hypothesize and illustrate a certain job's increased difficulty without technology(3)	
G.4.2. Discover what changes in technology have occurred in a career chosen by a parent, grandparent, or an adult friend over a long period of time[1]	1. Discover changes in technology over time[1]	1.a. Interview a person of the student's choice concerning career-related technology changes over time and visually represent information discovered(2)	
G.4.3. Determine what science discoveries have led to changes in technologies that are being used in the workplace by someone employed locally[1]	1. Identify scientific discoveries{1} 2. Determine the science discoveries that led to changes in technologies[2]	1.a. List scientific discoveries using a graphic organizer(1) 2.a. Match scientific discoveries to changes in technology using a Venn diagram or comparison/contrast chart(2)	
G.4.4. Identify the combinations of simple machines in a device	1. Identify simple machines[1]	1.a. List simple machine's used in the home, the workplace, or elsewhere in the community(1)	

used in the home, the workplace, or elsewhere in the community[2]	2. Identify combinations of simple machines in a device[2]	1.b. Group machines according to type.(2)  2.a. Label the simple machines in a given device(1)  2.b. Collect examples of devices from the home, the workplace, or elsewhere which use combinations of simple machines(2)	
G.4.5. Ask questions to find answers about how devices and machines were invented and produced[2]	1. Ask questions about a machine's invention[2]  2. Investigate the invention and production of a certain device or machine [3]	1.a. Brainstorm questions about machines used daily.(1)  2.a. Research, using books, the Internet, interview, and native language sources, to discover how a chosen device or machine was invented or produced and present the information to others in a student-chosen form.(3)	
<b>Performance Standards: By the end of grade eight students will:</b>	<b>Sample Alternate Performance Indicators: (1-3 per standard)</b>	<b>Sample Performance Activities/Tasks: (1-2 per indicator)</b>	<b>Sources of Data</b>
G.8.1. Identify and investigate the skills people need for a career in science or technology and identify the academic courses that a person pursuing such a career would need[1]	1. Identify the skills necessary for a career in science[1/2]  2. Identify the academic courses necessary for a person pursuing such a career [1/2]	1.a. Generate a list of interesting careers in the area of science. Use a word web for each career to identify skills. Access a representative from each career to speak to the students and answer their questions.(2)  2.a. After meeting with a representative from interesting careers, construct an academic plan for each career(2)	
G.8.2. Explain how current scientific and technological discoveries have an influence on the work people do and how some of these discoveries also lead to new careers[2]	1. Explain how current scientific and technological discoveries have an influence on the work people do and how some of these discoveries also lead to new careers[2]	1.a. Illustrate the history of the telephone from the first phone to cell phones and list at least one new job associated with each development (2)  1.b. Illustrate the history of television from black and white to digital and list at least one new job associated with each development(2)	
G.8.3. Illustrate the impact that	1.Illustrate science's impact, both	1.a. Compare medical practices in the student's native country	

science and technology have had, both good and bad, on careers, systems, society, environment, and quality of life[2]	<p>good and bad, on the quality of life[2]</p> <p>2. Illustrate technology's impact, both good and bad, on the quality of life[2]</p>	<p>to medical practices in the United States on a T-list (with main ideas on one side of the "T" and details on the other). Debate the pros and cons of each practice(2)</p> <p>2.a. Advocate both the pros and cons of technological advances replacing humans in the workforce(2/3)</p>	
G.8.4. Propose a design (or re-design) of an applied science model or a machine that will have an impact in the community or elsewhere in the world and show how the design (or re-design) might work, including potential side effects[3]	1. Propose a design of an applied science model that will have an impact in the world and show how it might work, including potential side effects[3]	1.a. Cooperatively design new bicycle models to meet the student's needs (3)	
G.8.5. Investigate a specific local problem to which there has been a scientific or technological solution, including proposals for alternative courses of action, the choices that were made, reasons for the choices, any new problems created, and subsequent community satisfaction[4]	<p>1. Investigate a specific local problem solved by science or technology, the choices made, and the reasons for the choices[3]</p> <p>2. Use multiple sources in creating a presentation(4)</p>	<p>1.a. Investigate and graphically represent the problem of high PCB levels in fish in the Fox River(3)</p> <p>1.b. Investigate and graphically represent the problem of a shortage of perch in the bay of Green Bay(3)</p> <p>2.a. organize and present a multimedia report with information from multiple sources on a specific local problem solved by science(4)</p>	
G.8.6. Use current texts, encyclopedias, source books, computers, experts, the popular press, or other relevant sources to identify examples of how scientific discoveries have resulted in new technology[2]	<p>1. Identify recent scientific discoveries[2]</p> <p>2. Use sources to identify examples of how scientific discoveries have resulted in new technology[2]</p>	<p>1.a. Given pictures of new products, point to those which are scientific discoveries(2)</p> <p>1.b. Using various sources, list recent scientific discoveries(2)</p> <p>2.a. Match pictures or key words about scientific discoveries to pictures or key words about new technology(1/2)</p> <p>2.b. Illustrate through pictures, charts, models, or writing how the discovery of lasers resulted in new medical technology(2)</p>	

G.8.7. Show evidence of how science and technology are interdependent, using some examples drawn from personally conducted investigations[2]	<p>1. Conduct investigations involving science and technology[2/3]</p> <p>2. Show how science and technology are interdependent[2]</p>	<p>1.a. Complete an experiment and record the effect of different chemical combinations on the flavor and carbonation of soda pop(2)</p> <p>1.b. Use computer tools to collect data(2)</p> <p>2.a. Using key words, sentences, or pictures, record how science and technology work together in investigation(2)</p>	
<b>Performance Standards: By the end of grade twelve students will:</b>	<b>Sample Alternate Performance Indicators: (1-3 per standard)</b>	<b>Sample Performance Activities/Tasks: (1-2 per indicator)</b>	<b>Sources of Data</b>
G.12.1. Identify personal interests in science and technology; account for implications that these interests might have for future education, and options to be considered	<p>1. Identify personal interest in science and technology</p> <p>2. Determine implications that personal interest may have in the future</p>	<p>1.a. Given a list of science areas, rank each by personal preference</p> <p>1.b. Draw a picture of the student's interests in science and technology</p> <p>2.a. Match areas in science and technology to options in education or careers</p> <p>2.b. Write a "help wanted" advertisement corresponding to the student's interests</p>	
G.12.2. Design, build, evaluate, and revise models and explanations related to the earth and space, life and environmental, and physical sciences	1. Design, build, evaluation, and revise a model	<p>1.a. Draw a plan for a rocket that will fly (e.g., twenty feet)</p> <p>1.b. Using this plan, build a model rocket that will fly twenty feet</p> <p>1.c. Test the rocket, measuring and recording the results</p> <p>1.d. Make revisions according to the test</p>	
G.12.3. Analyze the costs, benefits, or problems resulting from a scientific or technological innovation, including implications	1. Analyze the costs, benefits, or problems resulting from a scientific or technological innovation	1.a. Compare the cost of computers in the school to the benefits or problems created	

for the individual and the community			
G.12.4. Show how a major scientific or technological change has had an impact on work, leisure, or the home	1. Show the impact of a change on work, leisure, or home	<p>1.a. Use role playing to show changes resulting from the invention of computers</p> <p>1.b. Create products individually and on an assembly line, recording and comparing the time needed per product</p>	
G.12.5. Choose a specific problem in our society, identify alternative scientific or technological solutions to that problem, and argue its merits	<p>1. Choose a problem</p> <p>2. Identify alternative solutions to a problem</p> <p>3. Argue the merits of various solutions</p>	<p>1.a. Given a list of activities, choose one to solve</p> <p>1.b. Given a list of problems, rank them by interest</p> <p>2.a. Brainstorm using a web to show many solutions to the problem</p> <p>2.b. Choose the problem's solution from a list of possible solutions</p> <p>3.a. Using an organizational visual, list the benefits and problems for each solution</p> <p>3.b. Complete open-ended sentences created by the teacher to show the merits of each solution</p>	